MAKING SENSE OF INFORMATION SYSTEMS FAILURES BY USING NARRATIVE ANALYSIS METHODS

LYNETTE DREVIN

ABSTRACT:
Early references to IS failure indicate that this phenomenon has been with us for a few decades. Numerous attempts are found in the literature to define or describe IS failure. It is shown that although much is known about IS failures and many solutions are given by researchers to avoid failure, many IS projects still founder. The problems may be experienced during development or during the use of the system. The problems could be in the area of financial constraints not being met or on the functionality side, e.g. user requirements not met.

This paper describes a current project on IS failure and narrative methods. Background information is presented on IS failure and narrative analysis methods as an approach to be utilised when making sense of failures. The way people tell stories and specifically their experiences of failures should be taken into account. Often stakeholders have different viewpoints of incidents and we want to ascertain the value of narrative analysis approaches when making sense of IS failures.

KEY WORDS:
Information systems failure, narrative analysis methods, understanding experience, case histories, context

1. INTRODUCTION

Reports in the media often refer to information systems (IS) failures and projects in general that fail. Much publicity is given to such incidents and statistics on IS failures and factors contributing to failures are given to accentuate these incidents (Standish, 1999, 2001, 2003, 2004; KPMG, 2005).

IS failures are seen as projects that experience trouble in meeting prescribed standards or goals, e.g. the estimated budget or time frameworks that are not kept, or user expectations that are not met. Literature reveals a relatively big set of factors contributing to IS failure and approaches to learn from previous failures are set forth. Companies and individuals experience financial and other

---

1 Computer Science and Information Systems, North-West University, Potchefstroom, South Africa, Lynette.Drevin@nwu.ac.za
losses such as image damage due to repeated IS failures (Fortune and Peters, 2005). Even though there are methods and approaches that strive to reduce failure, it seems that there is an absence of learning from previous incidents.

Very often an IS failure situation involves more than one person and therefore the accounts of the stakeholders describing the incident tend to be incoherent and from different perspectives. We are interested in the stories that the stakeholders produce (their 'narratives'). Stories told by stakeholders are subjective, but usually are constructed around a core of facts as remembered by the individuals (Lieblich, et al, 1998).

The aim of this paper is to present background information on the IS failure notion followed by a description of narrative methods as an approach to apply when making sense of IS failure. A methodology is proposed to utilise narrative methods when making sense of failure stories as generated by stakeholders. Finally a summary and discussion of future work will conclude this paper.

2. BACKGROUND ON IS FAILURE

Many terms are used when referring to software that fails, for example: IS failures, software crisis, software development problems, disasters, challenged systems, runaways, death march projects, development failures, the first three having been used for many years. Canimer (1958) used the term 'failure' in the business data processing domain and proposed solutions to avoid pitfalls when computerizing clerical jobs decades ago.

The term 'software crisis' was used during the NATO conferences in 1968 and 1969 (Naur and Randall, 1968, Buxton et al., 1969). The problems reported by the attendees of those conferences include topics such as software quality, complexity of large systems and estimating techniques. If we analyse topics of software development and software engineering conferences today we are still facing similar problems. These include managerial as well as technical problem areas (Glass, 1998; Standish, 1999; Yardley, 2002).
The Standish group regularly conducts surveys on projects issues and they publish the statistics, over a decade, of project failures, successes and challenged projects in their Chaos reports (Standish, 1999, 2001, 2003, 2004). Failed projects are those cancelled before completion. Successful projects are completed on time and in budget with all features and functionally aspects as originally specified. Challenged projects are completed projects but are over-budget or over time estimates and with fewer features and functions than were originally specified. The percentages of failures, successes and challenged projects over a few years are shown in figure 1.

![Project Success/Failure Rate](image)

**Figure 1** Project failures, successes and challenges (Standish, 1999, 2001, 2003, 2004)

The percentages of failed projects show an improvement from 1994 to 2004: 31% down to 18%. The cost overruns from 1994 to 2000 were reduced from 189% to 45%. The success rate was 16% in 1994 rising to 29% in 2004 (Standish, 1999, 2001, 2003, 2004). Generalisations cannot be made for all information systems as information on the size; types and complexity of systems included in these surveys are not known.

These figures are used as a motivation for continued research into the area of failed systems by researchers. In order to show that these figures are
sometimes criticized a few opposing views of specific researchers are given as follows: Jørgensen and Moløkken-Østvold (2006) have different views as those given by the Standish reports and argue that the 1994 figures might not be reliable. They argue that statistics on failure figures were much lower in later surveys, and other studies also suggested lower failure rates and cost overruns. Glass (2006) shares this line of reasoning and also challenges the Standish Group reports when referring to a software crisis. His view is that we have many successful software systems in use. The view of this author however is that the majority of literature sources on IS failure are still supporting the trend in the Standish reports and affirms the need that IS failures should be studied and improved practices be put into place.

There are many causes why Information systems are perceived as failures (Standish, 1998; Standish, 2001; Ewusi-Mensah, 2003; Yourdon, 2004):

- Time and/or budget constraints that were not met;
- Expectations of stakeholders not adhered to;
- User requirements and expectations not met;
- Quality not as anticipated.

The above list is not complete, but it highlights the mix of reasons why some IS are perceived as failures.

Researchers came forth with numerous factors that contribute to failure. These include (Keil et al., 1998; Bentley and Whitten, 2007):

- Lack of top management commitment to the project;
- Poor user commitment and/or inadequate user involvement;
- Requirements not well understood;
- Failure to manage the expectation of users;
- Changing scope;
- Lack of skills;
- New technology;
- Insufficient staffing;
- Lack of organisations' commitment to a systems development methodology;
- Poor estimation techniques;
- Inadequate people management skills;
- Failure to adapt to business change;
- Failure to manage the plan.
In order to improve the situation when developing systems, a plethora of success factors are presented in the literature. An example is the following. The CHAOS report (Standish, 2001) list a ‘recipe' for success. The factors they include to be more successful in projects are:

- Executive support, which influences the process and progress of a project;
- User involvement;
- Experience on the side of the project manager;
- Clearly defined business objectives;
- Minimized scope;
- Standard software infrastructure, whereby the developers can concentrate on business rules rather than technology;
- Firm basic requirements; though requirements change during the lifecycle, base level requirements are stable, ensuring results that the users and sponsors can see quickly;
- Use of formal methodology;
- Reliable estimates; estimation should be firm and should be a reflection of the true effort required.

Apart from factors indicating how to move towards more success when developing systems, a few approaches to avoid failure are also found in the literature. The following examples are described briefly.

Lyytinen and Hirschheim (1987) describe IS failures as multi-facetted, complex and not having simple solutions. It is necessary to understand and accentuate the contextual features of IS. Their work results in practical as well as research proposals. They argue that the use of empirical methods, field surveys, and experiments are limited and they propose further research areas and methods – especially more qualitative of nature.

A case study approach is used by Yardley (2002) where real-life failures are used to guide the reader through the lifecycle of a project. This is done to learn valuable lessons so that pitfalls can be identified and corrective action can be taken to ensure successful systems.

Other approaches for addressing the failure phenomenon are discussed in Fortune and Peters (2005). They describe the Systems Failures Approach, which draws heavily on system concepts. The goal of this approach is to do a systemic interpretation of a failure or potential failure and its context. They also refer to a few other approaches to understand failures. These approaches are divided into three categories:
Approaches concerned with project management, which can be applied to IS projects;
Approaches to understand failures in general, which can be applied to the IS domain;
Approaches that are developed for understanding IS failures as such; interpretive approaches and interaction approaches come under this category. The methods stem from the social sciences and the foundation is that reality is socially constructed.

An approach is introduced by Dalcher (2004) proposing the use of narrative methods. Narratives can be used in failure stories to explain why and how failures occur. When project disasters are studied, the environment, project, stakeholders involved, politics and decisions taken, are investigated. When the findings are disseminated a case study is used for reporting purposes. Case studies can explore interactions between people and their understanding of a situation. The view of Dalcher (2004) is that the failure case is a special example of the case study and that the term ‘case history’ should rather be used as the failure investigation takes place after the incident happened. Case histories not only contain descriptions of events, they also give perceptions, contextual background, focus and bias which may exist.

Narrative approaches are also proposed and used by Clandinin and Connelly (2000) as a way of understanding experience of people in many different settings. Moreover, they encourage researchers to use narrative inquiry in new ways to come closer to understanding the phenomenon under investigation. In this study the area under scrutiny is IS failure and hence narrative methods like this are attracting interest as a way of making sense of failure.

3. NARRATIVE METHODS

The main topic of this project is to determine the usefulness of narrative methods to make sense of IS failures. The social sciences domain uses narratives, for example to listen to the stories that people tell after incidents, e.g. accidents, traumatic episodes or illness.

3.1 WHY NARRATIVE METHODS

It is problematic to obtain information on failures and the contextual circumstances surrounding the failures. It seems that the different stakeholders do not all agree about what went wrong when IS projects failed and they attribute multiple reasons in their accounts when reflecting on the incidents. Supporting Dalcher's views, Fincham (2002) suggests that the narrative perspective provides a more ‘fully interpretive’ understanding of system development. Organisational
narratives are seen as sense-making tools that can evolve and change and aid in influencing behavior.

In an article on relevant IS research where IT project failure is the specific subject of research Young (2005) asserts that the "loss in relevance of IS research in general affects the survival of the field". He refers to the IT project failure phenomenon and mentions that even though project failures have been the object of study for many years, it is still poorly understood. There is a lack of knowledge on the methods and approaches that are available for investigating failures (Dalcher, 2004; Dalcher and Drevin, 2004; Young, 2005). There is a need for more qualitative methods for studying IS failures. Johnson (2006) supports this view. He argues that new approaches are needed for ‘accident investigation’ and states that there are few existing techniques that enable analysts to reason about the factors leading to and stemming from software failures. The challenge for practitioners is to learn from past experiences and not to repeat the same mistakes (Young, 2005).

The literature highlights the use of narratives in the IS project field, e.g. in the area of evaluating projects (Hedman and Borell, 2005), understanding the environment and the relationships in it (Remenyi, 2005) and the examination of information requirements (Alvarez and Urla, 2002).

The narrative approach to analyse IS failure is proposed for this study. The hypothesis stated is that narrative analysis methods may begin to address some of the mentioned concerns. This is done by taking into account the multiple views and perspectives of stakeholders and the rich contextual information and sometimes conflicting stories given by stakeholders when failed information systems are investigated.

3.2 NARRATIVE ANALYSIS AND IS FAILURE

Failure events are described by role-players via stories. Riessman (1993) states that the metaphor of ‘story’ implies that we create order and construct texts in our specific contexts. To narrate is to impose order on the flow of role-players’ experience to make sense of events. Narratives link to past activities but also show how individuals understand those actions. Narratives can be used in failures stories to explain why and how failures occur (Dalcher, 2004).

Fincham (2002) also supports the use of narratives when studying failures. He suggests that the narrative perspective provides a more ‘fully interpretive’ understanding of system development. Organisational narratives are seen as sense-making tools that can evolve and change and aid in influencing behavior.
 Examples and applications of narrative methods are in abundance in the literature and a subset of approaches will be included in this project. Titscher, Meyer, Wodak and Vetter (2000) describe different methods of text and discourse analysis and include the following:

- Content analysis
- Grounded theory
- Ethnographic methods
- Narrative semiotics
- Critical discourse analysis
- Functional pragmatics
- Distinction theory text analysis
- Objective hermeneutics

Cortazzi (1993) compiled different views on narrative analysis when investigating teaching aspects. These approaches include sociological and sociolinguistic models of narrative, psychological models of narrative, literary models of narrative and anthropological models of narrative.

Boje (2001) advocates the use of ‘antenarrative’ methods to take into account that stories appear to be told improperly: in a fragmented, multi-plotted and complex manner. He sets out eight antenarrative analysis options that can deal with fragmented and polyphonic storytelling to impose sense. The eight options he describes are: deconstruction, grand narrative, microstoria, story network, intertextuality, causality, plot and theme. Storytelling moves beyond the limits of hierarchy and classification. The researcher focuses on what was between the lines and what was left out.

As can be seen from the above views from authors, there are many ways that stories can be analysed and narratively approached. The challenge is to distinguish between the approaches, in order to identify those that can be imported to apply to IS failures.

The next section presents a methodology for this study where narrative methods will be used to make sense of IS failure.

4. **METHODOLOGY**

In narrative analysis, we want to make sense or give meaning to what is heard from stakeholders in order to learn from previous incidents. In order to understand what went wrong in an IS failure situation, it is necessary that the many different views of the role-players have to be incorporated to see the big picture. We have to interpret what is said in order to understand the situation under investigation. We can therefore argue that the underlying paradigm for this
work is interpretive. The use of narrative methods is typical of an interpretive paradigm where the understanding of a situation is important.

The overall approach for this study is inductive where the research questions will be enlightened or answered by observed data. The main research question is: How can narrative analysis methods be used to describe software failure situations? The research strategy will be case studies (case histories) where identified information systems projects will be investigated. It is extremely difficult to get access to data on IS failure as people and companies want to hide such incidents. The study will rather focus on systems that experience failure situations from time to time. Permission was already granted at an institution to conduct this practical part of the research. The data gathering method will be interviews with the stakeholders in failure situations and possibly documents pertaining to the cases. The data that will be obtained will be rich, subjective and not coherent as there will most likely be multiple voices or views describing the same situation. This data is qualitative and will be analysed by using narrative methods.

The research process will be as follows. IS failure will be studied as part of a comprehensive literature survey. The definitions of failure and success, examples of failed systems and factors contributing to failure and success will be compiled. Narrative analysis methods will then be investigated to determine their nature and usefulness when looking into IS failure. Some approaches are more interpretive in nature and others are more positivistic in nature, so a taxonomy of possible narrative analysis methods will be constructed from the literature. These methods will be representative of specific narrative approaches that exist and areas such as the underlying philosophy or theoretical basis will be taken into account. The techniques or methods used in the analysis approaches will be looked into. Strengths, weaknesses, features and characteristics of each narrative method will be extracted and presented in table format. This taxonomy will be enhanced or strengthened by obtaining expert input, e.g. academia and practitioners. This will be done by using questionnaires and/or interviews.

Next, a failure signature has to be established using the previously mentioned taxonomy. This will be done using a set of questions to be asked when a failure happens to get a profile of the failure. In order to match a specific failure (story) against the taxonomy a matching algorithm has to be developed during the research process. The result will provide a way (possibly a tool) to select the most suitable method of narrative analysis. This could result in an alternative method or a combination of approaches to apply to failure stories rather than a single method.
The chosen narrative analysis approach will be applied to the stories of participants reflecting failure situations in order to verify or validate the taxonomy and the results will be given as feedback to the users or stakeholders. This will give the researcher information regarding the extent of usefulness of the narrative methods as applied to the IS project domain when failures occur. The taxonomy can be revised as a result of user feedback.

Anticipated contributions of this work include:
- Taxonomy of narrative analysis methods.
- Answers to the question: How and to what extent can we use narrative methods, to make sense of IS failure situations?

5. **SUMMARY AND CONCLUSIONS**

This paper presented an overview of the IS failure phenomenon. A short history, definition, failures factors, statistics, and the lack of research methods were discussed. Possible approaches to study failures were given and it was shown that there is still evidence that sense-making is problematic, which indicates that current methods to investigate failures could be changed or improved.

The use of narrative methods is proposed, to analyse IS failure stories as recounted by stakeholders. We want to make sense of and to give meaning to previous incidents so that we can learn from history. Multiple views and perspectives of stakeholders and the rich contextual information of IS failures should be taken into account when failure situations in information systems are investigated. The nature of narrative methods has been briefly outlined, and a research plan has been devised to test their applicability to IS failure.

It is, however, acknowledged that other ways of investigating IS failures may also be utilized to improve of the current situation. Pluralistic approaches where combined methods are used may also be possible.

The anticipated value of this work is to contribute to the methods when studying IS failure to ascertain whether approaches from other disciplines can be imported to the field of software development outcomes, for improved sense-making.

Future work include the completion of the taxonomy of narrative methods, the investigations of IS failure case histories as well as the analysing of the stories from the cases. Evaluations and conclusions of this work will be reported on in future publications.
6. ACKNOWLEDGEMENTS

The author would like to extend her thanks to:

- The National Research Foundation (NRF) for financial assistance. The opinions expressed in the paper are those of the author.
- The Centre for Faith and Scholarship (CFS) at the North-West University for financial assistance.
- The reviewers of this article and editors of this publication for valuable comments.

7. REFERENCES


Clandinin, D. and Connelly, F. *Narrative inquiry: Experience and story in qualitative research*, Jossey-Bass, San Francisco, USA.


LYNETTE DREVIN


